

WHAT IS CLAIMED IS:

1. A gas-filled cushioning device, comprising:

a multi-layer film formed into a gas-filled membrane having an interior compartment containing at least one capture gas constituent,

said multi-layer film including a first layer comprising a combination of at least one aliphatic thermoplastic urethane and at least one copolymer of ethylene and vinyl alcohol, wherein the first layer includes up to about 50 wt. % of aliphatic thermoplastic urethane, and a second, outer layer comprising a flexible resilient elastomeric thermoplastic material,

said multi-layer film being capable of selectively resisting an outward diffusion of said capture gas constituent and permitting an inward diffusion pumping of at least one mobile gas constituent.

2. The gas-filled cushioning device according to Claim 1, wherein said first layer includes between about 1 wt. % to about 30 wt. % of aliphatic thermoplastic urethane.

3. The gas-filled cushioning device according to Claim 1, wherein the thermoplastic material of said second layer comprises a thermoplastic urethane selected from the group consisting of polyester, polyether, polycaprolactone, polyoxypropylene and polycarbonate macroglycol based materials and mixtures thereof.

4. The gas-filled cushioning device according to Claim 1, wherein said first layer including a combination of at least one aliphatic thermoplastic urethane and at least one copolymer of ethylene and vinyl alcohol has an average thickness of between about 0.5 mils to about 10 mils and said second layer of thermoplastic material has an average thickness of between about 5 mils to about 100 mils.

5. The gas-filled cushioning device according to Claim 1, wherein said capture gas is nitrogen.

6. The gas-filled cushioning device according to Claim 2, wherein said first layer includes between about 5 wt. % to about 25 wt. % of aliphatic thermoplastic urethane.

7. The gas-filled cushioning device according to Claim 1, wherein said copolymer of ethylene and vinyl alcohol is selected from the group consisting of copolymers including an ethylene content of between about 25 mol. % to about 48 mol. %.

8. The gas-filled cushioning device according to Claim 1, wherein said first layer also includes an aromatic thermoplastic urethane.

9. The gas-filled cushioning device according to Claim 1, wherein said first layer includes:

(a) 50 wt. % to about 97 wt. % of at least one copolymer of ethylene and vinyl alcohol;

(b) 3 wt. % to about 50 wt. % of at least one aliphatic thermoplastic urethane; and

(c) up to about 3 wt. % of one or more aromatic thermoplastic urethanes;
wherein the total constituency of said first layer is equal to 100 wt. %.

10. The gas-filled cushioning device according to Claim 1, further comprising a third layer including a thermoplastic urethane selected from the group consisting of polyester, polyether, polycaprolactone, polyoxypropylene and polycarbonate macroglycol based materials and mixture thereof; said third layer and said second layer being disposed so as to sandwich the first layer.